

Class I, HEXAPODA.**ORDER XI, ORTHOPTERA.****ON A COLLECTION OF NON-SALTATORIAL
ORTHOPTERA FROM PARAGUAY.***

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For several years I have been receiving from Mr. W. T. Foster, of Sapucay, Paraguay, numbers of Orthoptera taken by him within a radius of ten miles of Sapucay. The U. S. Department of Agriculture purchased about one thousand specimens from Mr. Foster and the U. S. National Museum has acquired several hundred specimens from the same source. These three collections are now deposited in the National Museum and form the subject of this paper.

It was my original intention to prepare a complete faunal treatise on the Orthoptera of Paraguay but the lack of general collections from various portions of that republic makes that impractical at this time. I therefore present the following as a contribution to the knowledge of the Orthoptera of Paraguay. In subsequent papers I hope to treat of the saltatorial forms represented in these collections.

In the identification of these specimens I have been aided by the works of Giglio-Tos and Brancsik, those of the former being especially valuable as forming a list from which to work.

A comparison of the species here treated with those recorded in the various articles by Giglio-Tos in Boll. Mus. Torino shows the fauna of the region about Sapucay to be quite different from that of certain other portions of Paraguay. The country surrounding Sapucay is described by Mr. Foster in a letter under date of May 14, 1902. The following is quoted from this letter:

"Sapucay is a small village situated at the base of a low table land the elevation of which is 800 feet above the surrounding country. * * *

* During the coming year I hope, with the coöperation of Dr. H. G. Dyar, to promulgate a system of nomenclature with the hope of securing a comparatively stable basis. Then a revised nomenclature will be adopted, in some cases agreeing with the results arrived at by Krauss and others and in other cases radically different. But for the present the old nomenclature is used.

The tend of the face of the table land is northwest and southeast. The country to the southwest and east is generally level, broken by low hills rising abruptly from the plains, which extend to the level cattle breeding lands of the Missions, which in turn gives place to the low swamp land of the southwest corner of Paraguay, which, with the exception of a narrow fringe along the rivers Paraguay and Alto Parana, is given over to the anaconda and tiger (jaguar). I was several months down there collecting water birds but do not have any very pleasant recollections of the district. Periodical floods extend for leagues inland, filling up the swamps which in turn extend for miles; patches of forest from a few hundred feet to a mile in diameter occupy any land rising a few feet above the swamp. A few wandering tribes roam the large forests of the Alta Parana but the rest is a desolate waste.

"I do not find that the table land mentioned above bears a different fauna than that of the low lands, nearly all specimens taken by my collecting boys on the higher lands being duplicated by others from the plains.

"The winter is now about commencing and the frost during the months of June and July is somewhat severe, with the result that insects are correspondingly scarce. I therefore do but little collecting during the winter months but turn my attentions to bird and mammal skinning."

The total number of non-saltatorial specimens sent in by Mr. Foster is 105, comprising 27 species: 3 Forficulidæ, 12 Blattidæ, 7 Mantidæ and 5 Phasmidæ.

Family FORFICULIDÆ.

Anisolabis azteca Dohrn.

Forcinella azteca Dohrn, Stett. Ent. Zeit., xxiii, 226, 1862.

Anisolabis azteca Scudd., Proc. Bost. Soc. Nat. Hist., xviii, 302, 1876.

Anisolabis antennata Kirby, Journ. Linn. Soc., xxiii, 517, 1891.

Anisolabis bormansi Scudd., Bull. Mus. Comp. Zool., xxv, 5, pl. 1, fig. 1, 1893.

Anisolabis azteca Bormans, Das Tierr., ii, 49, 1900.

Two males without date. These specimens are exactly similar to the type of *bormansi* except that the forceps are strongly incurved apically, as is often the case with male specimens, and the antennæ have segments 11 and 12 pale in one while in the other the right antenna has segments 12 and 13 pale and the left one segments 13 and 14. Most species with certain ones of the antennal segments pallid

exhibit more or less variation in this respect. Besides these two specimens from Paraguay and the type of *bormansi* from the Galapagos Islands, the National Museum contains specimens of this species from California, Arizona and Florida in the United States and from Porto Rico in the West Indies. The synonymy of *bormansi* with *azteca* is based upon a study of the above material. The United States specimens were identified several years ago by Prof. Scudder who critically examined them at my request. He pronounced them to be *azteca* and did not attempt to refute my statement that they were specifically similar to the type of his *bormansi*. These United States specimens are females and measure 11.5 to 13.5 mm. in length exclusive of the forceps, and the banding of the femora and the number of pallid segments of the antennæ are quite variable. In both size and coloration these two forms intergrade and I feel safe in the establishment of their synonymy. The identity of Kirby's *A. antennata* from Bermuda with *azteca* was pointed out by Bormans.

Immature specimens of some species of *Psalis* bear a strong resemblance to certain apterous species of this genus and a careful study is often necessary to separate them.

Labia paraguayensis, new species.

Female. Brown, paler below; legs pale yellowish. Antennæ 11 to 12 jointed, brownish, unicolorous. Pronotum scarcely as broad as the head, subquadrate, slightly broader than long, the lateral borders very thin. Elytra slightly longer than the pronotum, unicolorous; wings aborted. Abdomen flattened, broad, widened in the middle, the third and fourth segments of the female with lateral folds, the fourth segment of the male similarly furnished. Forceps of the female moderately stout, triquetrous, contiguous at the base, slightly curved, especially at the tip where the points cross a little when the forceps are closed; inner margin straight to near the tip and with several dull unequal serrations, contiguous to the tip when closed; forceps of the male subcylindrical, moderately and quite uniformly incurved, widely separated at the base and armed on the inner edge at the middle of the apical half with a small tooth and at the middle of the basal half with an angular projecting shoulder, small but distinct. Pygidium of the male prominent, quadrate, the truncate tip slightly notched at each side.

Length, exclusive of the forceps, ♂ and ♀, 7.5 mm.; forceps, ♂, 2.25 mm., ♀, 1.75 mm.

Two females, February; one female, one male, no date.

Type. — No. 8025, U. S. National Museum.

Apterygida linearis Eschscholtz.

Forficula linearis Esch., Entomogr., i, 81, 1822.

Forficula taniata Dohrn, Stett. Ent. Zeit., xxiii, 230, 1862.

Apterygida taniata Borm., Das Tierr., ii, 110, 1900.

Forficula huteipes Scudd., Proc. Bost. Soc. Nat. Hist., xviii, 255, 1876.

Sphingolabis taniata Borm., Biol. Cent.-Amer., Orth., i, 12, pl. 2, figs. 17-19, 1893.

Apterygida linearis Rehn, Proc. Acad. Nat. Sc., Philad., 1903, 310, 1903.

Seven females, November ; four males, one female, no date.

The employment of Eschscholtz's old name for this common and widely distributed species brings up the question of whether absolute identification is necessary to justify the resurrection of old unidentified specific names for species more recently characterized. Personally I am of the opinion that it is justifiable, for it seems better to utilize old identified names for known species even at the expense of a few recent names than continue them as meaningless terms or included in doubtful synonymy. The one essential thing to be observed, and one to be insisted upon, is that no such application of an old unidentified name to a known species shall be made when the description or diagnosis of the old species differ in any particular from the characters exhibited by the known species to which the old name is applied. I therefore employ here the name *linearis* instead of the more recent *taniata* as has already been done by Mr. Rehn.

Family BLATTIDÆ.

Anaplecta albomarginata Saussure & Zehntner.

Anaplecta albomarginata Sauss. & Zehnt., Biol. Cent.-Amer., Orth., i, 26, 1893.

Anaplecta albomarginata Giglio-Tos, Boll. Mus. Torino, xv, No. 377, 1, 1900.

One female, November.

Anaplecta lateralis Burmeister.

Anaplecta lateralis Burm., Handb. Ent., ii, 494, 1838.

Anaplecta lateralis Giglio-Tos, Boll. Mus. Torino, ix, No. 184, 1, 1894.

Anaplecta sosia Sauss., MS.

One female, October.

The type of *A. sosia* Sauss., apparently undescribed, is in the National Museum from Costa Rica. It is mentioned as a new species by Biolley in Tomado, del informe del Museo Nacional, 43, 1900, but no reference is given. It does not seem to differ specifically from this specimen from Paraguay.

Kakerlac borellii Giglio-Tos.

Loboptera borellii Giglio-Tos, Boll. Mus. Torino, xii, No. 302, 3, 1897.

One female, February.

Ischnoptera brasiliensis Brunner.

Ischnoptera brasiliensis Brunn., Nouv. Syst. Blatt., 130, 1865.

Ischnoptera brasiliensis Giglio-Tos, Boll. Mus. Torino, xv, No. 377, 2, 1900.

Seven males, February, September and October.

This species is very closely allied to *I. uhleriana* Sauss., and may be but a form of that species. The females of all the species of this genus are apparently much scarcer than the males.

Ischnoptera vilis Saussure.

Ischnoptera vilis Sauss., Rev. Mag. Zool., xxi, 112, 1869.

Six males, December to May.

Blattella borellii Giglio-Tos.

Phyllodromia borellii Giglio-Tos, Boll. Mus. Torino, ix No. 184, 2, 1894.

One male, March.

This imperfect specimen, lacking the body and most of the legs, seems to agree fairly well with the description of this species except that the femora are black and the elytra measure but 7.5 mm. in length.

Blattella conspersa Brunner.

Phyllodromia conspersa Brunn., Nouv. Syst. Blatt., 106, 1865.

One male, no date.

This species is somewhat smaller than *B. brunneriana*, which has been recorded from Paraguay. These two species may prove to be the same.

Blattella germanica Linnæus.

Blatta germanica Linn., Syst. Nat., ed. xii, ii, 688, 1766.

Phyllodromia germanica Brunn., Nouv. Syst. Blatt., 90, fig. 7, 1865.

Blattella germanica Caudell, Proc. Ent. Soc. Wash., v, 234, 1903.

Phyllodromia bivittata Serv., Orth., 108, 1839.

Two males, October; one female, February.

Some orthopterists consider *bivittata* Serv. as distinct from *germanica* Linn. but from a study of specimens from the United States, Porto Rico, Mexico and South America, I find the venation of the wings offers no constant character for their separation.

This species has been mentioned from Paraguay in several papers.

Nyctibora confusa Giglio-Tos.

Nyctibora confusa Giglio-Tos, Boll. Mus. Torino, xii, No. 302, 8, 1897.

One female February.

This species was recorded by Giglio-Tos in various papers on the Orthoptera of Paraguay under the name *M. holosericea* Burm.

Panchlora nivea Linnæus.

Blatta nivea Linn., Syst. Nat., ed. x, i, 424, 1758.

Panchlora nivea Brunn., Nouv. Syst. Blatt., 274, 1865.

Panchlora nivea Giglio-Tos, Zool., Jahr., viii, 805, 1895.

Three males, two females, October to March.

Panchlora thalassina Saussure and Zehntner.

Panchlora thalassina Sauss. and Zehnt., Biol. Cent.-Amer., Orth., i, 93, 1893.

One male, one female, February.

The species of this genus are quite closely allied to each other and I believe that some synonymy may be expected among them.

Latindia sp. ?

The collection contains one male specimen, which is unfortunately in such poor condition as to permit of only a doubtful generic determination.

Family MANTIDÆ.

Mantoida brunneriana Saussure.

Chetessa brunneriana Sauss., Mem. Mex., iv, 14, 1871.

Mantoida brunneriana Westw., Synop. Mant., 1, 1889.

One male nymph, March.

Musonia livida Serville.

Thespis livida Serv., Orth., 172, 1839.

Musonia livida, Westw. Synop. Mant., 6, 1889.

Three males, January, February.

These specimens agree very well with the original description of Serville. The specific characters there given, together with the generic characters exhibited by the specimens themselves, make me quite sure of the correctness of the determination. The borders of the prothorax in these specimens are very finely serrate and one specimen is of an obscure greenish color. The exact measurements are as follows:

Total length, 34 mm.; anterior femora, 8 mm.; anterior tibia, exclusive of the apical spur, 3 mm.; intermediate femora, 8.5 mm.; posterior femora, 12 mm.; elytra, 25 mm.; wing, 23 mm.; cerci, 3 mm.; supra-anal plate, 3 mm.; width of supra-anal plate at the base, 1 mm.

The genus *Musonia* has a superficial resemblance to *Oxyops*,* but structurally it falls into quite a different group.

*The genus *Oxyops* of Saussure, described in 1869, is preoccupied by *Oxyops* Schonh., a genus of Coleoptera described in 1826. For the orthopterous genus I propose the name *Oxyopsis*.

Coptopteryx argentina Burmeister.

Mantis argentina Burm., Berl. Ent. Zeitschr., viii, 238, 1864.

Coptopteryx argentina Sauss., Bull. Ent. Suisse, iii, 66, 1869.

Coptopteryx argentina Westw., Synopsis Mant., 6, 1889.

Five males, five females, December to March.

The males exhibit some variation in size, one measuring but 43 mm. in length of elytra and the pronotum is only 16.5 mm. long. But the shape and venation of the wings of this small specimen shows it to belong to this species. Two of the large specimens exhibit venational variation in that the wing in the first and second axillaries of one merge 8.5 mm. from the tip, while in the other specimen the merging of these veins occurs at a point 24 mm. from the tip of the wing, the latter distance apparently the normal one.

Brunneria brasiliensis Saussure.

Brunneria brasiliensis Sauss., Bull. Ent. Suisse, iii, 240, 1870.

Brunneria brasiliensis Sauss., Mem. Mex., iv, ii, 135, pl. ii, figs. 31, 31a, 1871.

Six males, four females, October to March.

This has been reported from Paraguay, but seems not to have been observed recently.

Cardioptera vitrea DeHaan.

Cardioptera vitrea DeHaan, Bijdr. Orth., 82, 1842.

Cardioptera vitrea Westw., Rev. Mant., 15, pl. iv, fig. 7, 1889.

Eight males, October to February.

The males of this genus, not having the tibiæ carinate, often cause more or less confusion in the use of generic tables and are apt to be wrongly placed.

Acontista bimaculata Saussure.

Acontista bimaculata Sauss., Bull. Ent. Suisse, iii, 229, 1870.

Acontista bimaculata Giglio-Tos, Boll. Mus. Torino, ix, No. 184, 3, 1894.

Acontista bimaculata Giglio-Tos, Zool. Jahr., viii, 805, 1895.

Five males, October to March.

This handsome little species is somewhat variable in color, some being quite green and others brownish.

Acanthops sinuata Stoll.

Mantis sinuata Stoll, Spectr., pl. 4, fig. 14, 1787.

Acanthops sinuata Westw., Rev. Mant., 24, 1889.

Acanthops sinuata Giglio-Tos, Zool. Jahr., viii, 806, 1895.

Two males, six females, November to February; six nymphs, January to March.

The elytra of these females measure less than 25 mm. in length, and their abdomens are more ampliate than shown in the figure of Charpentier and Serville, being 15 mm. across the widest part. The bright colors of the wings and abdomen shown in the figures of Charpentier are absent in the dried specimens before me.

Family PHASMIDÆ.

Anisomorpha borellii Giglio-Tos.

Anisomorpha borellii Giglio-Tos, Boll. Mus. Torino, xii, No. 302, 16, 1897.

Anisomorpha crassa Giglio-Tos (not Blanch.), Boll. Mus. Torino, ix, No. 184, 4, 1894; Zool. Jahr., viii, 806, 1895.

Two females, January and March.

The wing pads are very small and in dried specimens the yellow bands of the antennæ are usually obscured.

Olcypoides lateralis Fabricius.

Mantis lateralis Fabr., Ent. Syst., ii, 15, 1793.

Phocylides lateralis Giglio-Tos, Zool. Jahrs., viii, 806, 1895.

One male, February.

In dried specimens the costæ of the wings and the short elytra are of an obscure yellowish color.

Bacunculus dubia, new species.

Female.—Color of dried specimen greenish; head longer than the pronotum, slightly less than one half as long again as broad, unarmed; antennæ with more than fifty segments, more than twice as long as the anterior femora, first segment much flattened, broadened, about twice as long as broad, second rounded, scarcely twice as long as broad, third more slender, cylindrical and several times as long as broad. Body unarmed; prothorax scarcely twice as long as broad and marked dorsally with a cruciform depression; mesothorax nearly six times as long as the pronotum, cylindrical, not swollen at the insertion of the legs; metathorax similar to the mesothorax but a third shorter. Abdomen slender, gradually tapering to the last segment, which is less than one half as broad basally as the first segment: all the segments twice as long as broad and none noticeably expanded; operculum small, passing but little the apex of the eighth segment. Cerci long and slender, twice as long as the apical segment of the abdomen. Legs short and relatively stout, unarmed; first segment of the tarsi longer than the remainder together.

Total length 66 mm.; head, 4 mm.; pronotum, 2.5 mm.; mesonotum, 15 mm.; metanotum, 9 mm.; abdomen, 31.5 mm.; cerci, 4.5 mm.; antennæ, 40 mm.; anterior femora, 15 mm.; intermediate femora, 10 mm.; posterior femora, 12.5 mm.; anterior tibiæ, 14 mm.; intermediate tibia, 9 mm.; posterior tibia, 12.5 mm.

One female, February.

Type.—No. 8027, U. S. National Museum.

I have compared this specimen with descriptions or specimens of all the species from South America known to me, and find it to agree with none of them.

Paraleptynia, new genus.

I find it necessary to characterize a new genus for a somber-colored and uninteresting-appearing phasmid contained in the collection. It is a member of the subfamily Clitumninae, slender of form, wholly unarmed and related to my genus *Parabacillus* and the closely related *Leptynia* of Pantel. It is apparently more nearly added to the latter, hence the above name. It is readily differentiated from both the allied genera by the antennae, which, at least in the male, the female at present unknown, is about two thirds as long as the anterior femora and composed of distinct segments. The terminal segment of the abdomen is apically concave and hollowed out below, the cerci round and differing from both *Parabacillus* and *Leptynia* by having no basal thorn.

This genus is apparently related in some respects to section "b" of the Bacillid subgenus *Baculum* of Saussure* based on *B. ramosus*, an insect of uncertain habitat. But the unarmed head and non-ampliate limbs prove its distinctness.

Paraleptynia fosteri, new species.

Male. Color of dried specimen, light brownish. Head longer than the prothorax, twice as long as broad, unarmed; antennae with 18 segments, 1 twice as long as broad, basally depressed; 2 about as long as broad, half the length of 1, cylindrical; 3 nearly twice as long as 1 and 2 together; 4 about half as long as 3; the succeeding ones of approximately the same length as number 3, except the last three which are scarcely twice as long as broad, except the apical one which is slightly more, due however to its smaller size rather than absolute length. Body unarmed; pronotum scarcely twice as long as broad, divided by a mesial transverse impression and furnished on the anterior half with three longitudinal furrows; mesothorax six times as long as the prothorax, cylindrical, but little swollen at the insertion of the legs; metathorax similar to the mesothorax but somewhat shorter; median segment not indicated. Abdomen cylindrical, segments one to six about three times as long as broad, the last three segments subequal, about twice as long as broad, the seventh and eighth, slightly swollen at their proximate ends, the apical segment carinate dorsally, slightly tapering and posteriorly angularly incised, the lateral angles curved inwards as obscure teeth and bordered with minute black denticles. Cerci moderately short, cylindrical, projecting obliquely downwards and bent slightly inwards at the tips, not

* Mel. Orth., 11, 112, 1870.

extending beyond the tip of the abdomen. Legs long and slender, unarmed, the genicular angles somewhat prominent; tarsi with the first segment longer than the others taken together.

Entire length, 78 mm.; length, head, 4 mm.; prothorax, 3 mm.; mesothorax, 18 mm.; metathorax, 15 mm.; abdomen, 38 mm.; antennæ, 20 mm.; anterior femora, 31 mm.; intermediate femora, 21 mm.; posterior femora, 23 mm.; anterior tibia, 31 mm.; intermediate tibia, 22.5 mm.; posterior tibia, 27 mm.; cerci, 1 mm.

One male, February.

Type.—No. 8026, U. S. National Museum.

***Ceratiscus laticeps*, new genus and species.**

A large female Phasmid, taken on Jan. 27, apparently represents a new genus and species. It belongs to the subfamily Clitumninæ, but, unlike the other members of that group, it is a large insect with very elongate operculum. The antennæ are short, being considerably less than one half as long as the anterior femora, and consist of twenty distinct segments; the first subquadrate and flattened, the second nearly round, the third twice as long as broad, the following two or three transverse and closely united, and the remainder longer than broad, the terminal eight or nine being twice or more than twice as long as broad. The head is very broad, nearly as broad as long, much broader than the thorax and smooth, except two small round depressions on top, behind and between the bases of the antennæ. Pronotum scarcely twice as long as broad, with a transverse impression, borders emarginate; mesonotum and metanotum unarmed, the former more than six times as long as the pronotum, the latter somewhat shorter, being but five times the length of the pronotum. Intermediary segment not clearly indicated. Body smooth. Operculum as long as the basal four segments of the abdomen. Cerci short and pointed, convex on the inner side. Legs moderately slender; anterior femora strongly curved basally and dorsally, serrated with strong teeth; tibiæ unarmed; intermediate femora and tibiæ armed with a single angular lobe near the base, above on the tibiæ and below on the femora;* posterior legs armed as the intermediate, all the lobes being scarcely higher than the width of the limbs bearing them. All the tarsi have the basal segment longer than all the rest taken together.

Entire length, exclusive of the operculum, 123 mm.; head, 6 mm.; prothorax, 4 mm.; mesothorax, 27 mm.; metathorax, 20 mm.; abdomen, 66 mm.; cerci, 1 mm.; operculum, from the point of attachment to the tip, 35 mm.; anterior femora, 31 mm.; anterior tibiæ, 38 mm.; intermediate femora, 27 mm.; posterior femora, 23 mm.; width across widest part of the head, 5 mm.; of pronotum, 3 mm.

Type.—No. 8102, U. S. National Museum.

In many ways this species resembles the *Bacteria clinteria* of Westwood, and it may, upon comparison with the type of that species, prove identical with it. But I scarcely think so, as it differs from the figure and description of that insect in having the head proportionately much broader and by having the middle and posterior legs with angularly lobate femora and tibiæ.

* One of the tibiæ lacks the lobe.